Early detection and prevention of first symptoms of psychiatric disorders in adolescence

el Bouhaddani, Saliha

DOI:
10.33612/diss.99345675

WHAT IF I FALL?
OH, BUT MY DARLING
WHAT IF YOU FLY?

E. Hanson

TRANSDIAGNOSTIC SCHOOL-BASED INTERVENTION FOR ADOLESCENTS WITH EARLY PERSISTENT PSYCHIATRIC SYMPTOMS:

AN INITIAL SINGLE-GROUP EFFECT STUDY

Saliha el Bouhaddani, Wim Veling
Barbara Schaefer, Theo Doreleijers, Lieke van Domburgh

This chapter is published as

El Bouhaddani, S., Veling, W., Schaefer, B., Doreleijers, T. A. H., & van Domburgh, L. (2019) Transdiagnostic school-based intervention for adolescents with early persistent psychiatric symptoms: An initial single-group effect study. Early Intervention in Psychiatry. doi: 10.1111/eip.12755

ABSTRACT

Aim

Mental health intervention programs for adolescents generally focus on specific symptoms, such as anxiety or depression. Psychiatric symptoms in adolescence are often heterogeneous, transient, and shift over time. These characteristics require a transdiagnostic approach with emphasis on positive psychological development. This study aimed to examine the feasibility and effectiveness of Mastermind, a novel transdiagnostic intervention targeting general underlying mechanisms of psychiatric symptoms in adolescents.

Methods

Adolescents were screened for psychiatric symptoms with the Strengths and Difficulties Scale in a school-based program in two consecutive years. Adolescents were eligible for the intervention when they had psychiatric symptoms at both screening assessments. Participants received an eight weeks program containing elements of empowerment and attention bias modification. Psychiatric symptoms were assessed before the start of the intervention, immediately after the intervention and at six months follow-up.

Results

241 adolescents were eligible for the intervention, of whom 80 participated (mean age 12.5 years). Generalized Estimating Equations, adjusted for gender and educational level, showed a decrease of negative attention bias, psychotic, anxiety, depression and behavioural symptoms immediately after intervention. The effects remained at follow-up. Overall risk for psychiatric disorders, distress and low self-esteem had decreased at follow-up.

Conclusion

A simple two-step school-based screening can identify adolescents with persistent psychiatric symptoms. The Mastermind transdiagnostic group intervention may be effective to reduce psychiatric symptoms, enhance self-esteem and lower the risk for developing psychiatric disorders.

INTRODUCTION

Psychiatric symptoms, including psychotic experiences, are common in adolescence [1, 2]. Over time, these symptoms constitute a risk factor for developing a psychiatric disorder and they are associated with functional impairment [3]. Therefore, adolescents with psychiatric symptoms are an important target group for preventive interventions. However, psychiatric symptoms in adolescence are heterogeneous, shift over time and are rarely disorder-specific [4–8]. These characteristics require a transdiagnostic approach with emphasis on positive psychological development rather than psychopathology [9].

A transdiagnostic approach is based on the assumption that common mechanisms explain various symptoms. Although transdiagnostic approaches are linked to robust and generalisable results [10, 11], existing transdiagnostic youth interventions have mainly focused on internalising symptoms [9]. This study aims to explore a transdiagnostic approach for a broad range of persistent mental health problems in a school setting. In order to treat adolescents with persistent multiple psychiatric symptoms, we developed the Mastermind intervention. This intervention focuses on two mechanisms related to mental wellbeing and the reduction of risk for psychiatric disorders: empowerment and attention bias [12–14].

Empowerment is associated with positive psychological development [15] and aims at developing prosocial relationships, gaining social resources and strengthening identity [16, 17]. Eisman and colleagues have argued that empowerment consists of three different components: an intrapersonal component, an interactional component, and a behavioural component. In this study, the primary focus was the intrapersonal component. Studies indicate that youth empowerment programmes are a promising strategy to promote healthy development [13, 18], and that self-esteem is a core component of youth empowerment [19]. Adolescents who have low self-esteem are more likely to have a negative social identity and to develop harmful behaviours. Therefore, strengthening self-esteem while learning skills may change self-perception and help to prevent the development of psychiatric disorders.

Cognitive biases are another set of general mechanisms associated with the emergence and persistence of psychiatric symptoms [14]. Attention bias, which is defined as a systematic tendency to focus on negative information [20], is one of these cognitive biases. Attention Bias Modification (ABM) procedures have been designed to train attention away from negative information towards positive information with the aim of reducing symptoms [21–23].

ABM has been examined in both adult and adolescent samples. Although some studies have found that ABM has no effect on psychiatric symptoms [24], several meta-analytic studies have suggested that ABM is effective in treating anxiety and depression (e.g.22). Furthermore, a systemic review of ten studies of ABM as treatment for anxiety in children and adolescents found medium effect sizes of ABM.

The aim of this study was to identify adolescents with persistent psychiatric symptoms using a two-step screening process and to examine the effect of the Mastermind intervention. We hypothesised that after the intervention (i), participants would experience an improvement in self-esteem and a reduction in negative attention bias; (ii) their levels of psychiatric symptoms, and the risk for psychiatric disorder and distress would decrease, and (iii) these improvements would remain after a follow-up period of six months.

METHODS

Design

The study was approved by the medical ethical committee of the Vrije Universiteit Medisch Centrum (reference number 2013.247). Participants were measured at four points in time, divided into an observation period and intervention period. The observation period had two assessments: the baseline screening and the second screening 12 months later. Two assessments were made after the intervention: one directly after the completion of the intervention, the other six months after the completion of treatment. Participants served as their own controls, comparing individual differences in symptom levels between baseline and pre-treatment (observational period) with differences between pre-treatment and post-treatment/follow-up (intervention period). Figure 1 provides an overview of the design and measurements.

First and second-year high school students who reported high levels of psychiatric symptoms at both screening assessments were eligible for the intervention. The flowchart is shown in Figure 2. We used three criteria for high levels of psychiatric symptoms: 1. At least a borderline score on the self-reported Strengths and Difficulties Questionnaire (SDQ, see Measurements); 2. At least a borderline distress score on the self-reported SDQ; 3. At least a borderline score on the teacher-reported SDQ. Adolescents were selected for the intervention if they had a high self-reported SDQ score and/or a distress score at T0 *and* if they had a high self-reported SDQ score and/or a

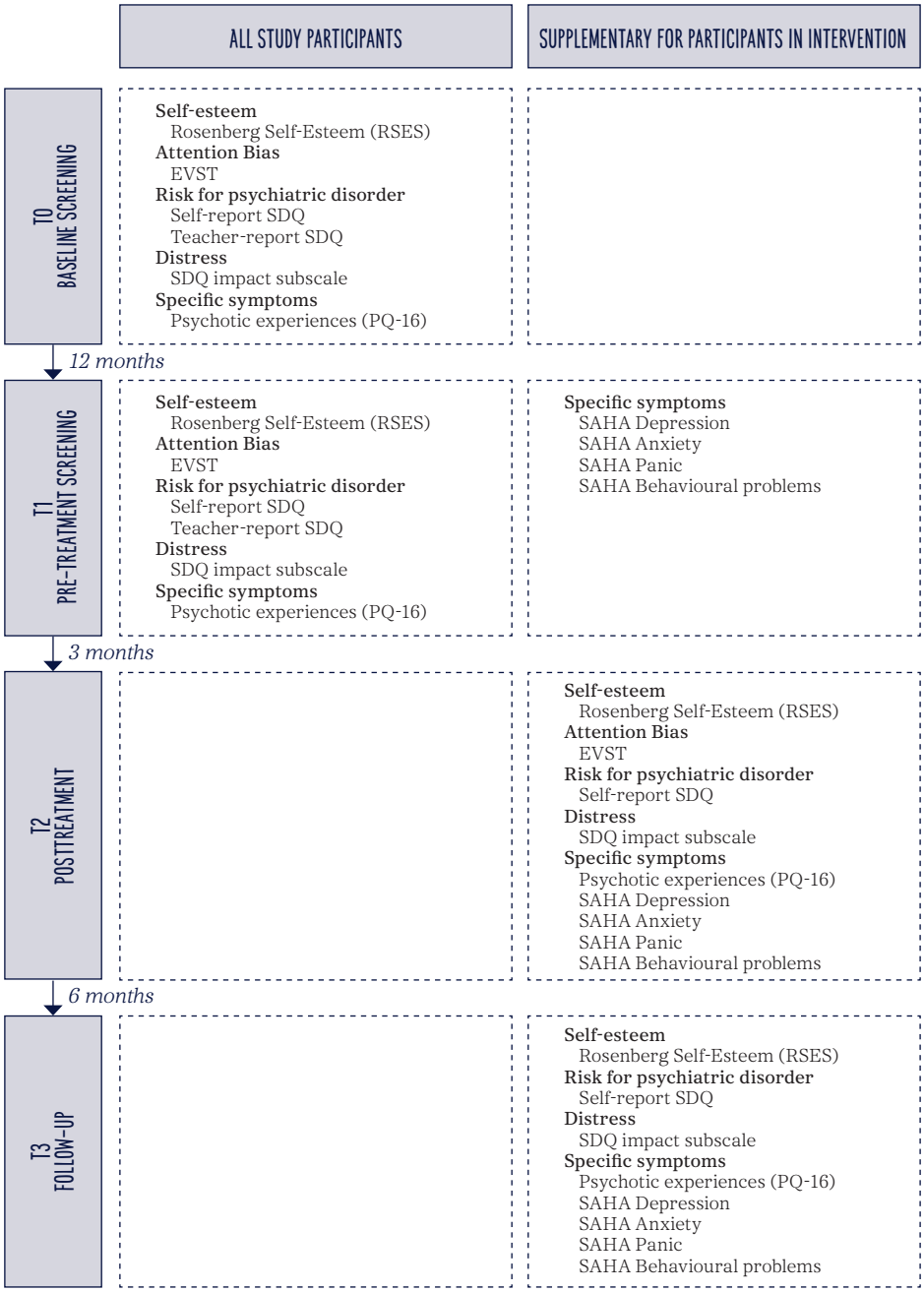

FIGURE 1. **Overview of all measurements from baseline (T0) till follow-up (T3)**

Note. RSES = Rosenberg Self-Esteem Scale; EVST= Emotional Visual Search Task; SAHA= Social And Health Assessment; SDQ= Strengths and Difficulties Questionnaire

distress score at T1. Adolescents were also selected if they had a high teacher-reported SDQ score at T0 and T1. The researchers approached eligible participants and their parents to request their participation and to obtain their informed consent. Before starting the intervention we verified whether selected participants received mental health support somewhere. None of the adolescents who agreed to participate in the intervention received mental health support somewhere else at the start of the intervention.

Intervention

The Mastermind intervention took place once a week, at school, after regular school hours. The intervention consisted of eight group sessions of 90 minutes. The groups were formed with only participants of the same school. This often led to assignment of all participants in one school to the same group. This made specific groups composition methods unnecessary. In the three large schools two intervention groups were needed. In that case participants were randomly assigned to a group. Each session was divided into two parts. The first part was a group session containing empowerment elements. The main components were: identity, coping with conflicting expectations, and role models. The methods were: psycho-education, role-playing, and group discussions. Two trainers conducted the group sessions. All trainers attended a supervision session every three weeks. In order to monitor the integrity of the intervention, all sessions were video recorded and shown during supervision sessions, after which the quality of the intervention could be enhanced.

The second part of each session was an individual ABM computer task that targeted negative attention bias [25].

We used a face detection task in which participants were presented with 16 facial expressions, each denoting either a positive emotion (happiness) or a negative emotion (anger, fear, or sadness). Participants were asked to search as quickly as possible for the positive emotion face among 15 negative emotion faces in a 4 x 4 square matrix. The ABM task had four blocks of each 36 trials with a short break between the blocks. To reduce the learning effect, the intervention task contained other stimuli faces than those were used to measure negative attention bias.

Measurements

Self-esteem - Self-esteem was used as a proxy to measure the intrapersonal component of empowerment. Several studies identified change in self-esteem as a core element in the empowerment process [19]. We therefore used the Rosenberg Self-Esteem Scale [26].

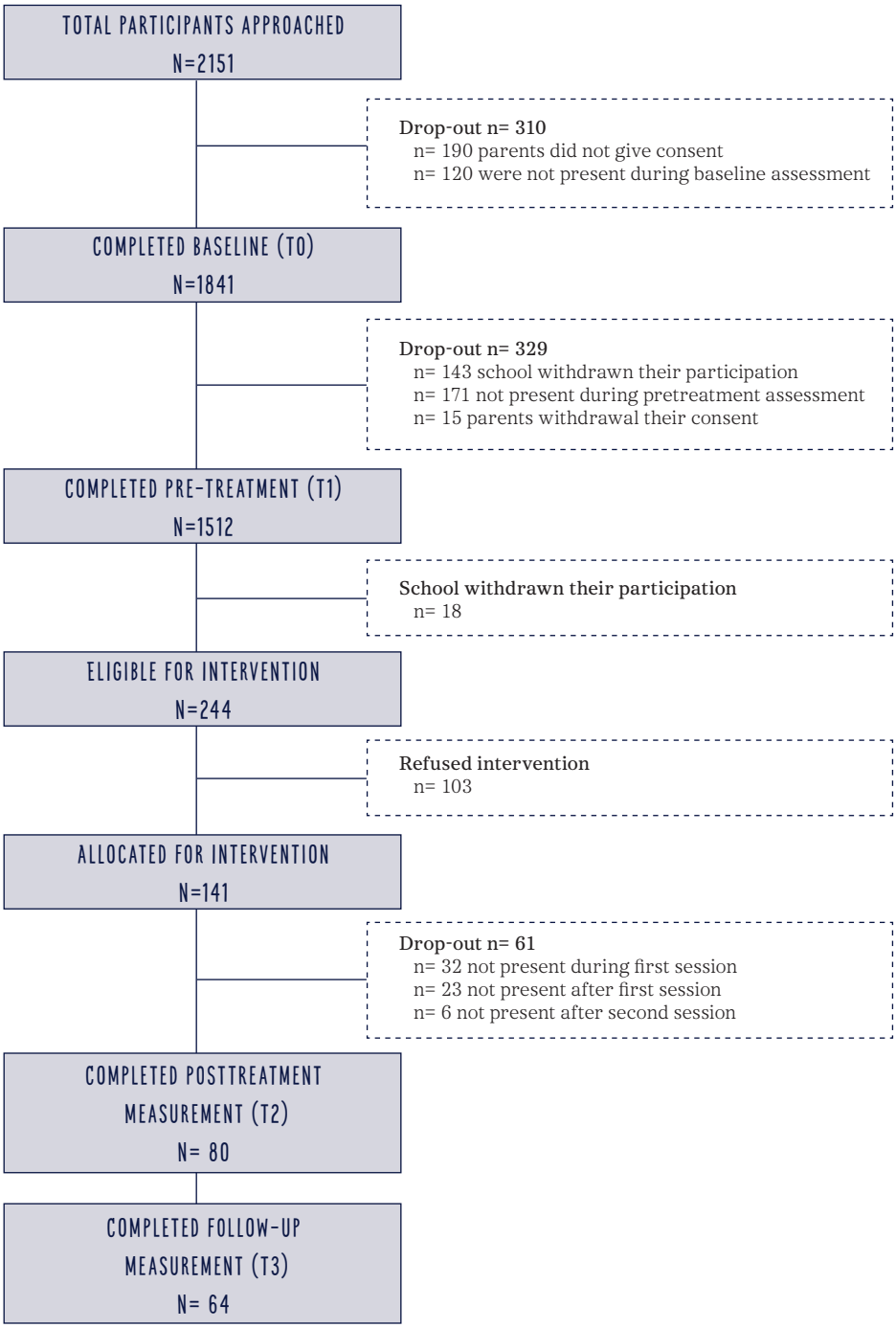

FIGURE 2. **Flowchart**

This is a ten-item scale with a four-point Likert scale (0 = strongly agree, 3 = strongly disagree). The RSES in this study had a high internal consistency with Cronbach's α of 0.79. Higher scores were interpreted as higher self-esteem.

Negative attention bias - The Emotional Visual Search Task (De Voogd et al., 2014 [27]) was used to measure negative attention bias. During the task, participants were presented a four by four grid of emotional faces and had to find a negative face amongst positive faces or a positive face amongst negative faces. An attention bias score was computed by subtracting the mean reaction time in milliseconds for negative emotional faces from the mean reaction time in milliseconds for positive emotional faces. Positive values indicated a bias for negative emotions, and negative values indicated a bias for positive emotions. As we were mainly interested in the course of psychosocial problems and symptoms, attentional bias was not assessed at follow-up. Further, at all assessments, attention bias was assessed under supervision of a research-assistant. As it was logistically not feasible to assess attention bias under supervision at follow-up (e.g. participants changing schools), we did not include attention bias in our follow-up assessment.

Screener risk for psychiatric disorders - The SDQ [28, 29] is a screening instrument of psychosocial problems and distress of psychosocial problems on daily functionality, designed to detect children and adolescents who are at high risk of psychiatric disorders. Cronbach's α for the total difficulties self-reported scale was 0.67. The SDQ contains 25 items with a three-point Likert scale. The cut off scores for the self-reported SDQ are as follows: normal: 0-15; borderline: 16-19; critical: 20-40, and for the teacher SDQ: normal: 0-11; borderline: 12-15; and critical: 16-40. In this study, participants who scored in the borderline and critical risk areas were considered at high risk of psychiatric disorder.
The distress supplement of the SDQ was used to measure overall distress and impairment. The items could be summed to generate a score that ranges from 0 to 10. A higher score indicated more distress. Cronbach's α for the impact scale was 0.57.

Specific psychiatric symptoms - At pre-treatment, post-treatment and follow-up, psychiatric symptoms were measured in detail with the Social And Health Assessment, a self-reported instrument that aims to measure risk behaviour and psychopathology in 11 to 18 year olds [30] For this study, the following sections were used:

- The depression scale, with items measuring depressive symptoms during the past month on a three-point scale. A higher score indicates more depressive symptoms. The scale has a high internal consistency, with a Cronbach α of .84.
- The anxiety scale consists of 13 items that predominantly describe cognitive modes of anxiety. The subscale has a three-point scale on which a higher score indicates more anxiety complaints. The scale had a high internal consistency, with a Cronbach α of .88.
- The panic scale consists of seven items that describe panic experiences. The subscale has a three-point scale on which a higher score indicates more panic complaints. The scale had a high internal consistency, with a Cronbach α of .74 in this study.
- The behavioural problems scale includes 16 items that assess behavioural problems of different severities. Participants report on a 5-point scale the number of times that their cases of antisocial behaviour occur. A higher score indicates more behavioural symptoms. The scale had an acceptable internal consistency, with a Cronbach α of .72.

In order to assess psychotic experiences, the Prodromal Questionnaire (PQ-16) was used [31]. The PQ-16 consists of 14 positive symptom items and two negative symptom items. The items were followed by questions about distress associated with the experiences. An experience was only classified as a psychotic experience if associated with at least moderate distress. Responses were made on a two-point scale, on which a higher score indicated more psychotic experiences. The PQ-16 had acceptable internal consistency with Cronbach's alpha of 0.78.

Analyses

Descriptive data were analysed using the Statistical Package for the Social Sciences, version 23. Differences in the socio-demographic characteristics, baseline self-reported SDQs and teacher-report SDQs between refusers and participants were examined with independent t-tests and chi-squared tests.

Our data was structured within in a two-level hierarchy (intervention groups and participants). We examined whether correction for random intercepts and slopes at intervention group level was needed. Intraclass correlation coefficients ranged from 0.0% to 8.6%, indicating that observations from participants in one intervention group were no more similar than observations from other intervention groups and therefore multilevel analyses were not needed [32].

To confirm that no significant change occurred in the observational periods

(baseline and pre-treatment), paired sample t-tests were performed. Furthermore, Generalised Estimating Equations (GEE) were used to examine the effect of time in the observational period. In this study, the exchangeable correlation structure was used.

GEE were used to test the hypothesis that self-esteem would improve over the period from pre-treatment to follow-up and that negative attention bias would decrease from pre-treatment to post-treatment. To test the hypothesis and examine any changes from pre-treatment to follow-up, GEE were conducted for psychiatric symptoms, risk for psychiatric disorder and distress. As explorative analyses indicated significant effects for gender and educational level on psychosocial problems, all models were corrected for these variables. For each outcome, Cohen's *d* effect size was calculated for baseline to pre-treatment, for pre-treatment to post-treatment and for pre-treatment to follow-up by dividing the mean difference by the pooled standard deviation [33].

RESULTS

A total of 1,512 adolescents finished the screening at both T0 and T1. Of this sample, 244 adolescents (16%) were identified as having persistent psychiatric symptoms. One hundred and forty-one adolescents agreed to participation, of which 80 finished the intervention. Of these 80 adolescents, 69 (86.2%) scored persistently highly on the self-reported SDQ and/or on distress, and eleven (13.8%) had persistently high scores on teacher-report SDQ. Table 1 shows the characteristics of the participants, and eligible adolescents who refused to participate. No differences were found between participants and refusers in gender, age, educational level, ethnicity, baseline distress score or teacher-reported SDQs. However, compared to the refusers, participants had a significantly higher self-reported baseline risk for psychiatric disorder. Further, compared to refusers, participants had more often a lower socioeconomic status.

There were 12 different intervention groups, with an average number of participants of 6.8 (SD = 1.6) per group, a minimum of four and a maximum of nine participants per group. Drop-out analyses showed no differences in age ($t(108) = 1.54$, $p = .06$), gender (χ^2 (1) = .78, p= .38), pre-treatment self-reported risk for psychiatric disorder ($t(108) = 1.09$, $p = .86$), pre-treatment self-esteem ($t(108) = .89$, $p = .81$) and pre-treatment attentional bias ($t(108) = .71$, $p = .76$) between those who finished the intervention and those who dropped out of the intervention.

TABLE 1. Characteristics and group differences for participants and refusers (N=244)

	CHARACTERISTICS AND GROUP DIFFERENCES		
	Participants (n=80)	Refusers (n=164)	Group differences
Gender, n (%)			χ^2 (1) =1.74, p= .19
Male	27 (33.8)	69 (42)	
Female	53 (66.2)	95 (58)	
Mean age, years (SD)	12.58 (0.70)	12.69 (0.66)	t (242)= 1.18, p= .24
Ethnicity, n (%)			χ^2 (1) =.87, p= .35
Dutch	35 (43.5)	91 (55.5)	
Non-Dutch	45 (56.5)	73 (44.5)	
Socioeconomic status, n (%)			χ^2 (1) = 4.74, p= .03
Low-medium	28 (34.4)	33 (20)	
High	52 (65.6)	131 (80)	
Educational level, n (%)			χ^2 (2) =1.06, p= .59
Lower vocational	32 (40)	79 (48.2)	
General higher secondary	34 (42.4)	56 (33.9)	
Pre-university	14 (17.6)	29 (17.9)	
Baseline Risk for psychiatric disorder, M (SD)	15.11 (5.01)	12.74 (5.20)	t (242)= -3.11, p < .01
Baseline Distress, M (SD)	1.62 (1.66)	1.25 (1.62)	t (242)= -2.40, p = .14
Baseline teacher reported Risk for psychiatric disorder, M (SD)	8.81 (5.64)	9.85 (5.41)	t (209)= 1.27, p = .21

Course of self-esteem and negative attention bias over time

Table 2 shows that paired sample t-tests indicated no difference in the self-esteem of participants between baseline (M= 16.40, SD= 3.50) and pre-treatment (M= 16.40, SD= 3.15), t(79) = 0, p= 1.00, d= 0.00). Attention bias decreased significantly between baseline (M=820, SD=1469) and pre-treatment (M= 473, SD= 1313), t(79)= 2.21, p= 0.03, with a small effect size (d= 0.24).
In the intervention period from pre-treatment to post-treatment(M = -1325, SD = 1170), attention bias decreased significantly with a moderate effect size. Moreover, the mean score of attention bias shifted from a negative attention bias to a neutral/positive attention bias. Although self-esteem showed no significant change over time between pre-treatment and post-treatment (M=17.32, SD= 4.02), self-esteem improved significantly between pre-treatment and follow-up. Attention bias was not measured during follow-up (see table 3).

Course of psychiatric symptoms over time

Paired sample t-tests confirmed that from baseline (M= 14.99, SD= 5.29) to pre-treatment (M= 14.7, SD= 4.72) self-reported risk for psychiatric disorder, t(79) = 0.58, p = 0.57, d = 0.06, did not decrease significantly. Further, distress (t(79) = -0.76, p = 0.45, d = 0.09), teacher-reported risk for psychiatric disorder (t(74) = -0.42, p = 0.68, d = 0.09), and psychotic experiences (t(79) = 0.61, p = 0.55, d = 0.03) did not differ between baseline and pre-treatment (see table 2).

Tables 2 and 3 show the course of symptoms during the intervention. From pre-treatment to post-treatment, statistically significant decreases were observed for psychotic experiences, depressive symptoms, anxiety symptoms, panic symptoms, and behavioural symptoms. Scores for self-reported risk for psychiatric disorder showed no significant change over the time between pre-treatment and post-treatment (M= 14.2, SD= 5.20), at six month follow-up (M= 12.4, SD= 5.64) a significant time effect was found. Scores for distress showed only a significant change over time between pre-treatment and follow-up (see table 2).

TABLE 2 . **Mean, standard deviations and Cohen's d for all outcome measures over time**

	DESCRIPTIVES OVER TIME					
	Baseline n= 80 M (SD)	Pre-treatment n= 80 M (SD)	Posttreatment n= 80 M (SD)	Follow-up n= 64 M (SD)	Cohen's d (95%CI) Pre-treatment-Posttreatment	Cohen's d (95%CI) Pre-treatment-Follow-up
Self-esteem	16.40 (3.50)	16.40 (3.15)	17.32 (4.02)	19.25 (3.45)	0.22 (-0.06 - 0.57)	0.87 (0.53 – 1.18)
Attention Bias	820 (1469)	473 (1313)	-1325 (1170)	^	0.69 (-0.06 - 0.57)	^
Risk for psychiatric disorders	14.99 (5.29)	14.7 (4.72)	14.2 (5.20)	12.4 (5.64)	0.10 (-0.41 - 0.21)	0.44 (0.11-0.78)
Distress	1.72 (1.81)	1.90 (1.87)	1.87 (2.26)	1.28 (1.66)	0.02 (-0.30 - 0.33)	0.35 (0.01-0.68)
Teacher-reported Risk for psychiatric disorder	11.48 (4.97)	11.92 (4.43)	^	^		
Psychotic experiences	6.8 (3.03)	6.7 (3.83)	5.28 (3.75)	4.51 (3.35)	0.37 (0.06 - 0.69)	0.61 (0.26-0.94)
Depressive symptoms	^	27.26 (3.41)	16.94 (7.52)	11.71 (3.12)	1.77 (1.40- 2.13)	4.76 (4.06-5.34)
Anxiety symptoms	^	23.41 (6.33)	14.72 (9.10)	10.25 (6.67)	1.11 (0.77 – 1.44)	2.02 (1.61-2.43)
Panic symptoms	^	10.25 (2.77)	5.33 (4.39)	2.55 (2.42)	1.34 (0.99 - 1.68)	2.96 (2.44-3.39)
Behavioural symptoms	^	5.44 (7.67)	4.16 (6.43)	2.92 (4.47)	0.19 (-0.13 - 0.49)	0.40 (0.05-0.72)

^ *No data available for this time moment*

TABLE 3. **Courses of change during observational and intervention period**

	OBSERVATIONAL PERIOD		INTERVENTION PERIOD			
	Baseline – Pre-treatment`		Pre-treatment-Posttreatment`		Pre-treatment-Follow-up`	
	β (SE)	*p*	β (SE)	*p*	β (SE)	*p*
Self-esteem	-.08 (.48)	.87	1.01 (.65)	.12	2.95 (.68)	.00
Attention bias	-399.61 (155.34)	.01	-2205.18 (266.43)	.00	^	^
Risk for psychiatric disorders	-.31 (.54)	.56	-.48 (.53)	.37	-2.57 (.56)	.00
Distress	.18 (.23)	.45	-0.05 (.26)	.86	-0.68 (.28)	.01
Psychotic experiences	-.16 (.37)	.67	-1.47 (.44)	.00	-2.60 (.44)	.00
Depressive symptoms	^	^	-15.63 (.44)	.00	-10.33 (.89)	.00
Anxiety symptoms	^	^	-8.66 (.85)	.00	-13.40(.65)	.00
Panic symptoms	^	^	-4.93 (.45)	.00	-7.77 (.35)	.00
Behavioural symptoms	^	^	-1.28 (.57)	.02	-2.37 (.65)	.00

`Adjusted for gender and educational level; ^ no data available for this time moment

DISCUSSION

In this single-group effect study, promising results were found concerning a transdiagnostic intervention for persistent psychiatric symptoms in adolescents. The intervention aimed to enhance empowerment and reduce negative attention bias. At posttreatment assessment negative attention bias was not present. Self-esteem, which was used as a proxy measure for empowerment, improved between the baseline and six-month follow-up. A wide range of psychiatric symptoms had decreased after the intervention, and these results remained during the follow-up. These findings suggest that transdiagnostic approaches based on general psychological mechanisms may be effective in preventing further escalation of psychiatric symptoms in adolescence.

In line with the hypothesis, a positive change was found over time in the two mechanisms targeted. Negative attention bias showed a direct improvement in the intervention period, which is consistent with previous findings [25, 34]. However, the current study also found a small but significant improvement in the 12-month observational period preceding the intervention. This improvement may have been the result of a learning effect, since participants completed the same task during baseline and pre-treatment screenings. However, a negative

attention bias still remained after the observation period, while a shift from a negative attention bias to a neutral or positive attention bias was observed over the intervention period. As a result, it seems that this intervention was effective in teaching individuals to pay more attention to positive stimuli and less attention to negative stimuli.

The improvement in self-esteem was significant between pre-treatment and follow-up but not between pre-treatment and post-treatment. This pattern suggests that the intervention had a delayed impact on self-esteem. In other studies, empowerment, for which self-esteem may be considered a proxy, mediated the relationship between psychological processes and mental health [35]. The results of the current study revealed a reversed pattern. Improvement in the level of symptoms was followed by improvement of self-esteem during the follow-up. To internalise a positive self-image, a person must learn skills, become more self-conscious and change his or her behaviour [36]. Thus, changes in other mechanisms may precede changes in self-esteem, and changes in self-esteem may take time to occur.

As hypothesised, anxiety and depressive symptoms, psychotic experiences and behavioural problems decreased after the intervention, and participants had further improved at the follow-up. While results concerning levels of specific psychiatric symptoms were consistent with the hypothesis, the findings regarding the short-term effects of risk for psychiatric disorders and distress were somewhat unexpected. Although small to moderate effect sizes were found at follow-up on risk for psychiatric disorders and distress, a direct decrease at post-treatment was expected. One explanation is that the measure used, the SDQ, is a short screener that may be less sensitive to changes than the measures used for more specific symptoms.

Together with other studies [10, 37], the findings of the current study suggest that a transdiagnostic approach that targets core symptoms results in improvements in both these and forthcoming symptoms. In adolescents, for whom psychiatric symptoms more often than not co-occur, a transdiagnostic approach provides clinicians with a way to treat multiple psychiatric symptoms with a single intervention. This type of intervention may capture the dynamic and interactive nature of psychiatric symptoms more effectively than traditional interventions that focus on one or two specific symptoms. However, more research is required to gain insight into which underlying mechanisms are most relevant for interventions.

The current study had several strengths. Firstly, a two-stage screening strategy was used to identify at-risk adolescents. Psychiatric symptoms in adolescence are often transient, so to identify early symptoms of psychiatric

disorders reliably in the general population, adolescents should be screened at a minimum of two points in time. A course of persistent or increasing symptoms makes an early-stage psychiatric disorder or a heightened risk of a disorder more likely [38]. Additionally, to the best of our knowledge, the current study was among the first to examine the possible outcomes of a transdiagnostic intervention based on common mechanisms of developing psychopathology for a wide range of psychiatric symptoms including psychotic symptoms.

The main limitation of the current study is that it was a single-group study rather than a randomised controlled trial. While the improvements in symptoms during and after intervention in adolescents who had not improved over a one-year observation period suggest that the intervention was effective, it is possible that these improvements may have resulted from factors other than the intervention, such as time and normal development. Therefore, the results of the current study should be considered to be preliminary. Further development of transdiagnostic approaches is recommended as well as randomised controlled trials to confirm and extend the current findings. Additionally, the current study had a low participation rate. Of the 244 selected adolescents, only 80 participated in the intervention. However, no differences were found between those who refused participation and those who participated in the study except for a difference in the mean self-reported SDQ total score at baseline. This difference indicates that the group of refusers experienced fewer problems. As a result, it is more likely that the intervention group consisted of adolescents who themselves indicated that they had problems. Various reasons can explain why the group with problems identified by teachers refused to participate, such as a lack of self-awareness of symptoms, fear of stigmatisation or a lack of motivation. One reason frequently mentioned by the adolescents was that the intervention took place after school hours.

Conclusion

This transdiagnostic screening and intervention study reveal promising results in identifying adolescents with persistent psychiatric symptoms in schools and reducing persistent psychiatric symptoms and the risk for psychiatric disorders in adolescents; improvements persisted six months after the intervention. The patterns of change indicate that the intervention influenced the targeted underlying mechanisms of empowerment and negative attention bias. As a next step, a randomised controlled trial is needed to test the effectiveness of the intervention.

REFERENCES OF CHAPTER 6

1. Kessler RC, Berglund P, Demler O, et al (2005) Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry 62:593–602. doi: 10.1001/archpsyc.62.6.593

2. Polanczyk G V., Salum GA, Sugaya LS, et al (2015) Annual research review: A meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. J Child Psychol Psychiatry Allied Discip 56:345–365. doi: 10.1111/jcpp.12381

3. Balázs J, Miklósi M, Keresztény Á, et al (2013) Adolescent subthreshold-depression and anxiety: Psychopathology, functional impairment and increased suicide risk. J Child Psychol Psychiatry Allied Discip 54:670–677. doi: 10.1111/jcpp.12016

4. van Os J (2013) The dynamics of subthreshold psychopathology: implications for diagnosis and treatment. Am J Psychiatry 170:695–8. doi: 10.1176/appi.ajp.2013.13040474

5. Jane Costello E, Erkanli A, Angold A (2006) Is there an epidemic of child or adolescent depression? J Child Psychol Psychiatry Allied Discip 47:1263–1271. doi: 10.1111/j.1469-7610.2006.01682.x

6. Velthorst E, Nieman DH, Linszen D, et al (2010) Disability in people clinically at high risk of psychosis. Br J Psychiatry 197:1155–1167. doi: 10.1192/bjp.bp.109.075036

7. Hickie IB, Scott EM, Hermens DF, et al (2013) Applying clinical staging to young people who present for mental health care. Early Interv Psychiatry 7:31–43. doi: 10.1111/j.1751-7893.2012.00366.x

8. McGorry PD, Purcell R, Goldstone S, Amminger GP (2011) Age of onset and timing of treatment for mental and substance use disorders: implications for preventive intervention strategies and models of care. Curr Opin Psychiatry 24:301–6. doi: 10.1097/YCO.0b013e3283477a09

9. Garber J, Weersing VR (2010) Comorbidity of Anxiety and Depression in Youth: Implications for Treatment and Prevention. Clin Psychol Sci Pract 17:293–306. doi: 10.1111/j.1468-2850.2010.01221.x

10. Chu BC (2012) Translating Transdiagnostic Approaches to Children and Adolescents. Cogn Behav Pract 19:1–4. doi: 10.1016/j.cbpra.2011.06.003

11. Mychailyszyn MP, Brodman DM, Read KL, Kendall PC (2012) Cognitive-Behavioral School-Based Interventions for Anxious and Depressed Youth: A Meta-Analysis of Outcomes. Clin Psychol Sci Pract 19:129–153. doi: 10.1111/j.1468-2850.2012.01279.x

12. Aspy CB, Oman RF, Vesely SK, et al (2004) Adolescent Violence: The Protective Effects of Youth Assets. J Couns Dev 82:268–276. doi: 10.1002/j.1556-6678.2004.tb00310.x

13. Ozer EJ, Newlan S, Douglas L, Hubbard E (2013) "Bounded" Empowerment: Analyzing Tensions in the Practice of Youth-Led Participatory Research in Urban Public Schools. Am J Community Psychol 52:13–26. doi: 10.1007/s10464-013-9573-7

14. Mathews A, MacLeod C (2005) Cognitive vulnerability to emotional disorders. Annu Rev Clin Psychol 1:167–195. doi: 10.1146/annurev.clinpsy.1.102803.143916

15. Eisman AB, Zimmerman MA, Kruger D, et al (2016) Psychological Empowerment Among Urban Youth: Measurement Model and Associations with Youth Outcomes. Am J Community Psychol 58:410–421. doi: 10.1002/ajcp.12094

16. Ozer EJ, Douglas L (2013) The Impact of Participatory Research on Urban Teens: An Experimental Evaluation. Am J Community Psychol 51:66–75. doi: 10.1007/s10464-012-9546-2

17. Zimmerman MA, Stewart SE, Morrel-Samuels S, et al (2011) Youth Empowerment Solutions for Peaceful Communities: Combining Theory and Practice in a Community-Level Violence Prevention Curriculum. Health Promot Pract 12:425–439. doi: 10.1177/1524839909357316

18. Berg M, Coman E, Schensul JJ (2009) Youth Action Research for Prevention: A Multi-level Intervention Designed to Increase Efficacy and Empowerment Among Urban Youth. Am J Community Psychol 43:345–359. doi: 10.1007/s10464-009-9231-2

19. Roth JL, Brooks-gunn J (2003) Youth Development Programs: Risk, Prevention and Policy. J Adolesc Heal 32:170–182.

20. Cisler JM, Koster EHW (2010) Mechanisms of attentional biases towards threat in anxiety disorders: An integrative review. Clin Psychol Rev 30:203–216. doi: 10.1016/j.cpr.2009.11.003

21. Bar-Haim Y, Morag I, Glickman S (2011) Training anxious children to disengage attention from threat: A randomized controlled trial. J Child Psychol Psychiatry Allied Discip 52:861–869. doi: 10.1111/j.1469-7610.2011.02368.x

22. Hakamata Y, Lissek S, Bar-Haim Y, et al (2010) Attention bias modification treatment: A meta-analysis toward the establishment of novel treatment for anxiety. Biol Psychiatry 68:982–990. doi: 10.1016/j.biopsych.2010.07.021

23. Hertel PT, Mathews A (2011) Cognitive Bias Modification: Past Perspectives, Current Findings, and Future Applications. Perspect Psychol Sci 6:521–536. doi: 10.1177/1745691611421205

24. Cristea IA, Kok RN, Cuijpers P (2015) Efficacy of cognitive bias modification interventions in anxiety and depression: meta-analysis. Br J Psychiatry 206:7–16. doi: 10.1192/bjp.bp.114.146761

25. Dandeneau SD, Baldwin MW (2004) The Inhibition of Socially Rejecting Information Among People with High Versus Low Self-Esteem: The Role of Attentional Bias and the Effects of Bias Reduction Training. J Soc Clin Psychol 23:584–603. doi: 10.1521/jscp.23.4.584.40306

26. Rosenberg M (1965) Society and the adolescent self-image. Princeton University Press, Princeton, NJ

27. De Voogd EL, Wiers RW, Prins PJM, Salemink E (2014) Visual search attentional bias modification reduced social phobia in adolescents. J Behav Ther Exp Psychiatry 45:252–259. doi: 10.1016/j.jbtep.2013.11.006

28. Goodman R (1997) The Strengths and Difficulties Questionnaire: A Research Note. J Child Psychol Psychiatry 38:581–586. doi: 10.1111/j.1469-7610.1997.tb01545.x

29. Van Widenfelt BM, Goedhart AW, Treffers PDA, Goodman R (2003) Dutch version of the Strengths and Difficulties Questionnaire (SDQ). Eur Child Adolesc Psychiatry 12:281–289. doi: 10.1007/s00787-003-0341-3

30. Ruchkin, V, Schwab-Stone, M, Vermeiren R (2004) Social and Health Assessment (SAHA); Psychometric development summary. New Haven: Yale University.

31. Ising HK, Veling W, Loewy RL, et al (2012) The validity of the 16-item version of the prodromal questionnaire (PQ-16) to screen for ultra high risk of developing psychosis in the general help-seeking population. Schizophr Bull 38:1288–1296.

32. Twisk J (2013) Applied Longitudinal Data Analysis for Epidemiology. Cambridge University Press, New York

33. Cohen J (1988) Statistical Power Analysis for the Behavioral Sciences. NY: Routledge Academic, New York

34. Beard C, Sawyer AT, Hofmann SG (2012) Efficacy of Attention Bias Modification Using Threat and Appetitive Stimuli: A Meta-Analytic Review. Behav Ther 43:724–740. doi: 10.1016/j.beth.2012.01.002

35. Grealish A, Tai S, Hunter A, et al (2017) Does empowerment mediate the effects of psychological factors on mental health, well-being, and recovery in young people? Psychol Psychother Theory, Res Pract 90:314–335. doi: 10.1111/papt.12111

36. Baumeister RF (1999) Self-Concept, Self-Esteem, and Identity. Self 246–280. doi: 10.1016/B978-012134645-4/50027-5

37. Ellard KK, Fairholme CP, Boisseau CL,et al (2010) Unified Protocol for the Transdiagnostic Treatment of Emotional Disorders: Protocol Development and Initial Outcome Data. Cogn Behav Pract 17:88–101. doi: 10.1016/j.cbpra.2009.06.002

38. MacKie CJ, Castellanos-Ryan N, Conrod PJ (2011) Developmental trajectories of psychotic-like experiences across adolescence: Impact of victimization and substance use. Psychol Med 41:47–58. doi: 10.1017/S0033291710000449